REMARKS

Generally

Initially, Applicants respectfully submit that the Examiner appears to have not considered the claim amendments and remarks submitted on May 13, 2008 because the outstanding Office Action dated October 21, 2008 is nearly identical to the Office Action dated February 14, 2008. In particular, Applicants note that at page 6 of both Office Actions dated February 14, 2008 and October 21, 2008 the Examiner states that "Applicant's arguments with respect to claims 1-20 have been considered but are moot in view of the new ground(s) of rejection". However, in both Office Actions the Examiner maintains the same obviousness rejection over the same references. In view of at least the foregoing, Applicants are substantially resubmitting the arguments submitted on May 13, 2008 requesting the Examiner to kindly carefully review the currently pending claims and the arguments submitted herewith.

Claims 1-20 are pending. In this Response, no claims have been amended, added, or cancelled. However, Applicants note that claims 1, 5, and 15 were amended in the response submitted on May 13, 2008. As discussed above, Applicants respectfully request the Examiner to review and consider the claim amendments submitted on May 13, 2008.

Applicants respectfully request the Examiner to reconsider and withdraw the outstanding rejections in view of at least the foregoing and the following remarks.

Rejection under 35 U.S.C. § 103(a)

Claims 1-20 have been rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over U.S. Patent Application Publication No. 2004/0167670

(hereinafter "Goncalves") in view of U.S. Patent No. 6,266,142 (hereinafter "Junkins") and further in view of U.S. Patent No. 5,477,459 (hereinafter "Clegg"). Applicants respectfully traverse the rejection for at least the following reasons.

The Office has the initial burden of establishing a factual basis to support the legal conclusion of obviousness. In re Oetiker, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992). For rejections under 35 U.S.C. § 103(a) based upon a combination of prior art elements, in KSR Int'l v. Teleflex Inc., 127 S.Ct. 1727, 1741, 82 USPQ2d 1385, 1396 (2007), the Supreme Court stated that "a patent composed of several elements is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art." "Rejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness." In re Kahn, 441 F.3d 977, 988, 78 USPQ2d 1329, 1336 (Fed. Cir. 2006).

Generally, Applicants note that there are three different concepts presented by the presently recited claims and the applied prior art. The presently recited claims relate to using a light array distributed in a working area (a multi-room house, for instance) and determines the *world coordinate position* of a mobile robot in the working area using individually identified flickering lights controlled by the mobile robot. In contrast, Junkins is said to establish position and orientation measurements *between two objects.* Goncalves uses the *physical shape of landmarks* to detect the position of a mobile device. As such, it might be possible for Goncalves to use Junkins to, for instance, dock the mobile device, or other function that requires the relative position between two objects to be known. For instance,

Junkins can place a container 536 and crane container bucket 538 relative to a ship 532. Perhaps the crane could be a mobile device, its positioning next to the ship being controlled in a system analogous to Goncalves. The point being, the two might be combinable, but not in a way that would result in the present invention. What is missing from the applied art is the use of a light array to determine position in a world coordinate system, and there is no reason, teaching or suggestion for a modification that will result in the present invention, for the reasons outlined below.

In particular, it should be noted that claim 1 recites a mobile robot, comprising: a communications module for transmitting a light source control signal to selectively control flickering of each of a plurality of light sources of a landmark array provided in a working space such that each of said plurality of light sources can be separately detected by its flickering; an *image* processing module for calculating *image coordinates* of at least one of the plurality of the light sources by separately detecting the at least one light source by selectively controlling the flickering the light source, controlled to flicker in response to the light source control signal, from an image signal obtained by a camera; a pose calculation module for calculating world position coordinates of the mobile robot in the working space *using the calculated image coordinates and previously stored world coordinates of the light sources*," among other features recited in claim 1.

The features emphasized for the present argument note that *image coordinates of the selectively flickered light source* and the *previously stored world coordinates* of the light sources in a working area. Junkins primarily uses a quadrant detector to find a line of sight of four or more light sources to give a relative position of the object with the light sources to the object moving relative to

it. The Junkins lights can be controlled, but not separately controlled, for calculating *world* position coordinates of the mobile robot in the working space *using the calculated image coordinates and previously stored world coordinates of the light sources.*

Goncalves discusses a robot that includes a visual sensor, an example of which is a digital camera. (Paragraphs [0055]-[0056] of Goncalves). The visual sensor of Goncalves is used to visually recognize landmarks by there physical appearance (e.g., shape) to determine global position. (Paragraph [0058] of Goncalves). Goncalves further discusses that as the robot travels through its environment, it detects new physical landmarks, extracts 3-D features from the physical landmark, and determines displacements or positions from the robot to the respective features of the observed landmark. (Paragraphs [0083]-[0084] of Goncalves). Nowhere does Goncalves discuss "calculating *world* position coordinates of the mobile robot in the working space *using the calculated image coordinates [of at least one of the plurality of the light sources by separately detecting the at least one light source by selectively controlling the flickering the light source, controlled to flicker in response to the light source control signal, from an image signal obtained by a camera] and previously stored world coordinates of the light sources*," as recited in claim 1.

Applicants submit that Junkins does not disclose or suggest the teachings missing from Goncalves. Junkins discusses light beacons disposed on a first object and an electro-optical sensor disposed on a second object, where incident light energy from a beacon is measured as respective currents at leads or connections coupled to the electro-optical sensor, from which a rotational and

translation movement *of the second object relative to the first object* can be determined. (Col. 4, lines 9-26 of Junkins). That is, comparison of the currents flowing through the corresponding connections of the sensor can be used to determine the centroid location of the incident light, where the closer the incident light centroid is to a particular sensor connection, the larger the portion of current that flows through that connection. (Col. 4, lines 26-32 of Junkins). Nowhere does Junkins disclose or suggest "calculating *world* position coordinates of the mobile robot in the working space *using the calculated image coordinates [of at least one of the plurality of the light sources by separately detecting the at least one light source by selectively controlling the flickering the light source, controlled to flicker in response to the light source control signal, from an image signal obtained by a camera] and previously stored world coordinates of the light sources*," as recited in claim 1.

Thus, no combination of Goncalves and Junkins discloses or suggests a mobile robot that includes "calculating *world* position coordinates of the mobile robot in the working space *using the calculated image coordinates [of at least one of the plurality of the light sources by separately detecting the at least one light source by selectively controlling the flickering the light source, controlled to flicker in response to the light source control signal, from an image signal obtained by a camera] and previously stored world coordinates of the light sources*," as recited in claim 1. (emphasis added).

Clegg was applied due to the inclusion of basing the processing of light signals on the wavelength of the detected light source. This recitation was deleted from the independent claims, and in light of the disclosure of the paragraph

bridging columns 5 and 6 of Junkins. Clegg does not cure the deficiencies of Goncalves and Junkins, which have been discussed above.

Accordingly, Applicants submit that independent claim 1 is patentable over Goncalves, Junkins and Clegg and respectfully request that the rejection under 35 U.S.C. § 103(a) of claim 1, and of claims 2-4, which depend therefrom, respectively, be withdrawn. For reasons analogous to those presented for claim 1, Applicants submit that claims 5 and 15 are also patentable over Goncalves, Junkins and Clegg, and respectfully request that the rejection under 35 U.S.C. § 103(a) of claims 5 and 15, and of claims 6-14 and 16-20, which depend therefrom, respectively, be withdrawn.

In view of at least the foregoing, Applicants respectfully submit that the obviousness rejection over Goncalves, Junkins, and Clegg should be withdrawn.

Conclusion

Applicants invite the Examiner to contact Applicants' representative at the telephone number listed below if any issues remain in this matter, or if a discussion regarding any portion of the application is desired by the Examiner.

In the event that this paper is not timely filed within the currently set shortened statutory period, Applicants respectfully petition for an appropriate extension of time. The fees for such extension of time may be charged to our Deposit Account No. 02-4800.

In the event that any additional fees are due with this paper, please charge our Deposit Account No. 02-4800.

Respectfully submitted,

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